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EXAMINER

METZMAIER, DANIEL S

ART UNIT	PAPER NUMBER
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1712

DATE MAILED: 12/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/042,154

Applicant(s)

ISHITOBI ET AL.

Examiner

Daniel S. Metzmaier

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on September 13 & 30, 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claims 1-12 and 21 are pending.

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 13, 2004 has been entered.

Claim interpretation

2. The following claim observations/interpretations are made here as they pertain to the following rejections. Claims 10-12 set forth the concentration of the polishing accelerator and sol product. None of the remaining claims set forth any concentrations of the components of the sol product. The broad language of the salts forming the sol product and the polishing accelerator overlap. The preamble sets forth a polishing composition and reads on compositions that have the function of polishing, ie, polishing properties.

The sol product is set forth as a mixture comprising the species set forth in (i) or (ii) of claim 1. Said claim employs open language and is open to further ingredients including boehmite. Boehmite is a crystalline form of alumina and is commonly referred to as a sol or a slurry.

The claims are directed to a polishing composition comprising (a) water, (b) alumina crystal, and (c) a sol product. Said sol product is derived from an aluminum salt and a base or chelating agent and said sol (c) is obtained by high-shear stirring. Said high-shear stirring is not defined in the claims.

"Claims directed to products by process" are examined based on the product obtained rather than the method of making said product. The process limitations are given weight only to the extent the process limitation impart a patentable distinction to the product.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

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under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-7, 10-12 and 21 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Nissan Chemical Industries, Ltd., WO 99/35089 (hereafter Nissan), as evidenced by Erikson, US 6,080,216.

Nissan (example 1, page 16, second full paragraph) discloses aqueous alumina slurries (characterized at paragraph bridging pages 9 and 10 to first full paragraph of page 11) employing a polishing accelerator comprising basic aluminum nitrate. Said basic aluminum nitrate would have been expected to have limited solubility and result in the formation of amorphous sol particles for at least a portion of the basic aluminum nitrate. Said sol products are derived from an aluminum salt.

Erikson is cited (column 13, line 60, to column 14, line 8) as evidence that the art recognizes solution-based compositions or sols are made by dissolving aluminum salts such as basic aluminum nitrate in water. The use of basic aluminum nitrate in the Nissan reference would have been expected to produce at least some sol particles as claimed.

Nissan (page 12, first full paragraph) discloses the polishing accelerator is employed in a concentration of 0.1 to 10% by weight. Nissan (page 10, fifth full

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paragraph) discloses the concentrations of the alumina abrasive ranging from 0.5 to 20% by weight.

To the extent the Nissan compositions differ from the instant claims in the characterization of the accelerator as sol particles, said sol has not been shown to impart a patentable distinction to the compositions, which are employed the same components having overlapping concentrations thereof in the same utility, e.g., polishing.

To the extent the Nissan compositions differ from the instant claims in the product-by-process limitation that the sol (c) is obtained by high-shear stirring, the method step of high-shear stirring has not been shown to impart any patentable distinction to the composition. The claims nor the specification characterize the sol particles other than amorphous.

7. Claims 1-7, 10-12 and 21 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yamada et al, US 5,366,542. Yamada et al (example 2 and claims) discloses polishing compositions comprising alumina dispersed in water and in combination with aluminum salts and aminocarboxylic acid salts as chelating agents¹ and polishing accelerators. Patentees claimed concentration ranges for the salts and chelates reads on and is well within the instant claim 11 and 12 concentrations for the sol product.

¹ Applicants point out at page 16, first full paragraph of their response, the instant sols are formed not only by mixing the aluminum salt and the amino-carboxylic acid chelate compound but mixing by a high-shear stirrer. Yamada et al (example 2) employs said high shear mixer in formulating the polishing slurry employing the salts and chelating agents of Table 2. Since the same materials are employed in the same process, the resulting product would clearly be expected to be the same.

Yamada et al (examples) discloses crystalline alumina dispersions employing a polishing accelerator of an aluminum salt and a chelate. The disclosed crystalline alumina for polishing is an α -crystalline alumina dispersed in water and has a particle size of about 1.5 microns, reading on instant claim 21.

To the extent the Yamada et al compositions differ from the instant claims in the characterization of the accelerator as sol particles, said sol has not been shown to impart a patentable distinction to the compositions, which are employed the same components having overlapping concentrations thereof in the same utility, e.g., polishing.

Furthermore, the sol products are formed in the same high-shear mixing process as instantly disclosed. The same process would be expected to produce the same sol product. Applicants have proffered no evidence in rebut of said conclusion.

To the extent the Yamada et al compositions differ from the instant claims in the product-by-process limitation that the sol (c) is obtained by high-shear stirring, the method step of high-shear stirring has not been shown to impart any patentable distinction to the composition. The claims nor the specification characterize the sol particles other than amorphous.

8. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nissan Chemical Industries, Ltd., WO 99/35089 (hereafter Nissan), as evidenced by Erikson, US 6,080,216, as applied to claims 1-7, 10-12 and 21 above, and further in view of Peterson, US 5,669,941. Nissan discloses the compositions as set forth in the

above rejections over the same reference. Said rejection is incorporated herein by reference.

To the extent Nissan differs from claims 8-9 in the species in the sol product, the Peterson reference teaches conventional dispersions aids for the advantage of improving dispersion stability.

Peterson (columns 15-18) discloses alumina sols and alumina particle dispersions. Peterson (column 17, lines 23-39) discloses dispersion aids including ammonium hydroxide, aluminum chlorides or basic aluminum nitrates. Peterson further teaches the concentration of each depends on the concentration and the surface area of the dispersed particles.

These references are combinable because they teach alumina sols and alumina dispersions. It would have been obvious to one of ordinary skilled in the art at the time of applicants' invention to employ conventional dispersions aids as disclosed in the Peterson reference for the advantage of improving dispersion stability of the Nissan polishing slurries.

9. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al, US 5,366,542, as applied to claims 1-7, 10-12 and 21 above, and further in view of Peterson, US 5,669,941. Nissan discloses the compositions as set forth in the above rejections over the same reference. Said rejection is incorporated herein by reference.

To the extent Yamada et al differs from claims 8-9 in the species in the sol product, the Peterson reference teaches conventional dispersions aids for the advantage of improving dispersion stability.

Peterson (columns 15-18) discloses alumina sols and alumina particle dispersions. Peterson (column 7, lines 23-39) discloses dispersion aids including ammonium hydroxide, aluminum chlorides or basic aluminum nitrates and the concentration depends on the concentration of the surface area of the dispersed particles.

These references are combinable because they teach alumina sols and alumina dispersions. It would have been obvious to one of ordinary skilled in the art at the time of applicants' invention to employ conventional dispersions aids as disclosed in the Peterson reference for the advantage of improving dispersion stability of the Yamada et al polishing compositions.

Response to Arguments

10. Applicant's arguments filed September 13, 2004 have been fully considered but they are not persuasive.

11. Applicants' arguments are replete with characterizations in the prior art that the crystalline alumina does not disclose or suggest the amorphous sol (c) because it is crystalline. The rejections are based on the facts that each disclose crystalline particles (boehmite) and additionally contain an aluminum salt or basic aluminum salt under basic conditions as a polishing accelerator, which evidence has been provided that said salt would inherently from sol particles.

12. Applicants have amended the claims, which now set forth the sol (c) as obtained by "high-shear stirring". Product-by-process claims are examined based on the product. The process limitations are given weight only to the extent that said process limitations impart a patentable difference to the product. "The Patent Office bears a lesser burden of proof in making out a case of *prima facie* obviousness for product-by-process claims because of their peculiar nature" than when a product is claimed in the conventional fashion." See MPEP 2113.

The instant claims require "sol product (c) is amorphous" and is "obtained by high-shear stirring" the mixtures as set forth in the claims. The claims nor the specification characterize the sol particles other than amorphous. Claims 11 and 12 define the amorphous sol (c) concentration as 0.01-5 mass %. The remaining claims are silent regarding sol (c) concentration. The specification defines the concentration of the sol as:

The amount of the sol product added to the composition (content) is defined as the total weight of the employed aluminum salt and the compound for forming the sol product, the water content of each component being subtracted. (Emphasis added).

The references relied for the rejections clearly overlap said concentrations and therefore reads on the claimed concentrations.

13. Applicants (page 6 of the September 13, 2004 response) assert the examiner incorrectly characterizes the "aluminum salt" as the alumina salt. Said characterization has been corrected. Said mistyped characterization does not change the issues since the claims and the references refer to aluminum salts.

14. Applicants (page 6) assert the sol (c) can only be obtained by high-shear stirring the mixture of aluminum salts and the compounds as set forth in the claim. This has not been deemed persuasive since the formation of the sol particles would be expected to form with or without shearing based on accepted reaction kinetics known in the art. The shearing would be expected to reduce the particle size of the of the particle formation. Applicants do not characterize the particles other than by the process to form said particles. Since the prior art adds the same materials with mixing and applicants have not shown said high-shear stirring to impart an unexpected different to the product, said limitations to the process said product is made does not distinguish the product claims.

15. Applicants (page 7) assert the sol product is amorphous and is obtained by high-shear stirring. The boehmite materials require a hydrothermal treatment to have their crystalline structure. The sol particles expected to result from the aluminum salts of the prior art as a polishing accelerator are not hydrothermally treated. Furthermore, applicants do not show a distinction between mixing and high-shear stirring as claimed. The prior art products would have been expected to be amorphous in the absence of a crystallization step or hydrothermal treatment.

16. Applicants (page 8) assert the Nissan reference does not disclose or suggest the formation of an amorphous sol and the basic aluminum nitrate is a solution rather than a sol. Nissan discloses the formation of a crystalline alumina slurries and adds an aqueous solution of basic aluminum nitrate. Sol formation of the basic aluminum nitrate would have been inherent to forming the solution as is shown by the evidence of Erikson. Applicants do not characterize the sols other than by the process to make said

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sols. Since the prior art teaches that sols result from forming a solution of basic aluminum nitrate, one would expect at least some sol particle formation in the Nissan reference.

17. Applicants (pages 8 and 9) assert the Nissan reference lacks high-shear stirring to form said basic aluminum nitrate materials. Applicants have not met their burden of showing a nexus between the use of said mixing step and a resulting product difference.

18. Applicants' (page 9) remarks regarding the alumina crystalline size is clearly taught in the examples of Nissan.

19. Applicants' (page 9) remarks regarding the Nissan alumina suspension as boehmite, which is not amorphous is not deemed persuasive since the compositions would have both crystalline (boehmite) and amorphous sol (c) particles as claimed. The sol (c) particles resulting from the addition of the basic aluminum nitrate solution. Coincidentally, the basic aluminum nitrate solution has not been hydrothermally treated, as the boehmite material has to make it crystalline.

20. Applicants' (pages 10 and 11) assertions regarding the methods of making and the crystalline structure have not been persuasive. Applicants have not met their burden regarding the product-by-process limitations and presenting a nexus there between. The crystalline alumina and the sol particles resulting from the use of basic aluminum nitrate are not the same and applicants have not shown said two materials disclosed in the prior art to be distinct from the instant claims.

21. Applicants (page 10) assert that the prior art (Nissan and Erikson) uses of α -alumina or beohmite as a raw material which is not amorphous. This has been addressed above.
22. Applicants (pages 10 and 11) comments regarding the concentrations in claims 11 and 12 have been addressed above.
23. Applicants (page 11) assert that it is not correct to equate the sol (c) with the addition of a basic aluminum nitrate solution. Attention is directed to Erikson, which the citations are set forth.
24. Applicants (page 12) assert it is a hasty conclusion to consider the Yamada et al disclosure of mixing an aluminum salt and a aminocarboxylic acid based chelate compound produces the sol (c) claimed. Applicants direct attention to the high shear stirring limitations to attempt to distinguish the compositions. This has been addressed above regarding product-by-process limitations.
25. Applicants (page 13) assert the Yamada et al high-speed stirrer is not shown to be a high-shear stirrer. Applicants have not shown said stirring to have any affect on the resulting products that are claimed.
26. Applicants (pages 14 and 15) assert Peterson does not disclose the aluminum salts with a compound as claimed, alkaline compounds such as hydroxides. This has not been deemed persuasive sine the aluminum salts are basic salts and would be expected to alkalize the composition upon addition.

Furthermore, the claims are directed to a polishing composition in suspended form. Art is combinable as teaching sol and/or suspension compositions in the abrading

art. One skilled in the art would have logically looked to other alumina suspensions and there additives.

27. Applicants (pages 16-17) assert the skilled artisan would have no reasons to combine Peterson with the Yamada et al reference. This has not been deemed persuasive for the following reasons. "A prior art reference is analogous if the reference is in the field of applicant's endeavor or, if not, the reference is reasonably pertinent to the particular problem with which the inventor was concerned. *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992).", see MPEP 2145(IX). In the instant case, Peterson shows analogous art and materials for improving the dispersion properties of dispersions in grinding.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel S. Metzmaier whose telephone number is (571) 272-1089. The examiner can normally be reached on 9:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Daniel S. Metzmaier
Primary Examiner
Art Unit 1712

DSM